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ABSTRACT

There has been recent interest in Dynamic Assessment in the psychoeducational assessment of preschool children. This study investigated the concurrent validity between the Application of Cognitive Functions Scale (ACFS) (C. Lidz and R. Jepsen, 1999), a Dynamic Assessment, and the Leiter-Revised International Performance Test (Leiter-R) (G. Roid and L. Miller, 1997). Fifteen special needs preschool children were administered the pretest of the ACFS and the Leiter-R. It was hypothesized that similar subtests that measure similar properties of the two instruments would demonstrate significant positive correlations. Results give only partial support for the concurrent validity of the two assessment instruments. There were no cases of significant positive correlations between anticipated similar subtests, but there were four cases of significant positive relationships between unanticipated subtests. Variables such as sample size, scoring methods, actual similarities between subtests, and test format may account for these results. Suggestions for applying posttest ACFS scores with Leiter scores may give more accurate results on the two measures. An appendix contains the cover letter for the study. (Contains 4 tables and 39 references.) (Author/SLD)

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A CONCURRENT VALIDITY STUDY BETWEEN THE APPLICATION OF COGNITIVE FUNCTIONS SCALE AND THE LEITER-REVISED INTERNATIONAL PERFORMANCE TEST

By:

Tuvia Tatik

Thesis

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In

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Graduate School of Education and Psychology

A CONCURRENT VALIDITY STUDY BETWEEN THE APPLICATIONS OF COGNITIVE FUNCTIONS SCALE AND THE LEITER-REVISED INTERNATIONAL PERFORMANCE TEST

TUVIA TATIK

Thesis under the direction of Professor Dr. Carol Lidz

ABSTRACT

Dynamic Assessment is a relatively new instrument in the field of psychoeducational assessment. There has been recent focus on its use with the pre-school population. The purpose of this study is to investigate concurrent validity between the ACFS and Leiter-R. Fifteen special needs pre-school children were administered the pretest of the ACFS and the Leiter-R. It was hypothesized that similar subtests that measure similar properties of the two instruments would demonstrate significant positive correlations. Results gave only partial support for concurrent validity between the two assessment instruments. There were no cases of significant positive correlations between anticipated similar subtests, but there were four cases of significant positive relationships between unanticipated subtests. Variables such as: sample size, scoring methods, actual similarities between subtests and test format may account for these results. Suggestions of applying post-test ACFS scores with Leiter scores may give more accurate results on the two measures.

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Date _____

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INTRODUCTION

Dynamic Assessment is a relatively new approach to the field of psychological assessment. Standardized testing measures and compare a student's score on a series of tasks to a sample distribution of his/her peers; depending on a student's ranking a majority of educational planning decisions are made. Dynamic Assessment's goals differ from standardized testing. Its purpose is to develop new strategies and processes to make the student a more efficient learner. Feuerstein, Feuerstein & Gross (1996) states, "Dynamic Assessment's goal is to evaluate (not measure) the modifiability of individuals, the extent of their modifiability, the preferred modifiabilties of intervention required to reach the desired states of functioning...(p.300). Lidz (1996) writes: "Dynamic Assessment developed both as a reaction to dissatisfaction with existing procedures as well as positive attempts to design a model that is theory based, provides a meaningful description of cognitive functioning and links assessment with instruction"(p.281). Reuvein Feuerstein and his colleagues Feuerstein, Rand & Hoffman (1979) developed his own dynamic assessment instrument, The Learning Potential Assessment Device (LPAD). Feuerstein, Falik and Feuerstein (1998) write, "the goal of the LPAD is to discover the hidden potential of the individual, which is not revealed by manifest levels of functioning..."(p.102). The processes of the LPAD is to create conditions that elicit the appearance of deficit cognitive functions and determine their level, nature and amenability to change..." (p.107). The application of the LPAD and other dynamic assessment measures has generally been applied with older children. Lidz & Jepsen (1999) have developed The Applications of Cognitive Functions Scale (ACFS) the first Dynamic Assessment procedure that is curriculum based and relevant for pre-

school children. This scale not only gives scores on pre and posttests and interventions, but also includes a behavior rating scale. The ACFS has received recent support in studies of inter-rater reliability, intra-test reliability, and discriminative validity and criterion validity. This study adds to the growing pool of research concerning the ACFS and Dynamic Assessment and investigates the concurrent validity of the ACFS in relation to the Leiter International Performance Test -R (Leiter-R).

REVIEW OF LITERATURE

Overview of Dynamic Assessment

Dynamic Assessment is a relatively new psycho educational assessment procedure that connects assessment with intervention. A student's performance on a task can be increased when the child receives meaningful knowledge from an adult partner who will 'mediate' new strategies to the child by scaffolding the information to the child's level of functioning. Traditional psychoeducational assessment has relied on standardized procedures that compare a student's score to a representative sample of his peers on a series of verbal and/or perceptual tasks. This is known as 'static' assessment because a student's score is considered stable over the period of a child's development. Depending on the ranking of the score to the sample, a variety of educational decisions are made. Traditional psycho educational assessment instruments are very useful for diagnosing and classifying students but they are limited in producing information that can assist the student's performance in the classroom (Haywood, Brown & Wingenfeld, 1990). Anastasi (1981) state that "IQ tests are descriptive, not explanatory. No intelligence test can indicate the reason for one's performance" (p.63). Feuerstein et al (1979) criticized the method of using school achievement as a criterion of predictive validity for intelligence tests, stating that researchers are validating the instruments rather than examining change of the functioning of the individual. In fact, dynamic assessment results will actually show low test-retest reliability as its purpose is to create a change between the two administrations (Lidz, 1996). Campione (1973)& Carlson &Wiedl (1980) provided evidence of predictive validity of dynamic assessment tests when the criterion is change from achievement to response to intervention. Campione and Brown

(1987) wrote "the weaker the student the more need for detailed and explicit instruction" (p.54). Babad & Bashi (1981) agreed that there was a need to derive more relevant information from psychoeducational assessments. This void in terms of information relevant to the clinician from the assessment has caused a shift from a product (final score) to a process approach known as dynamic assessment. Haywood et al. (1990) characterized dynamic assessment procedure in terms of the following goals:

> (a) A test-teach –test sequence; (b) emphasis on assessment of processes of perception, thinking, learning and problem solving rather than the products of past opportunities to learn (c) teaching/learning of generalization of cognitive processes; (d) attempts to specify obstacles to more effective learning and performance; (e) attempts to specify response to teaching of genralizable processes; (f) attempts to specify conditions that will permit or encourage more effective performance; (g) attempts to distinguish between performance and potential, or between ignorance and inability" (p411).

Theoretical Bases of Dynamic Assessment

Dynamic Assessment's roots come primarily from two sources: one is from the Russian psychologist Lev Vygotsky, the other, the Israeli psychologist Reuven Feuerstein. Vygotsky (1896-1934) has became widely known for his theories regarding the central aspect that social interaction plays in the role of cognitive development. Bodrova and Leong (1996) write: "For Vygotsky, cognitive construction is always socially mediated; it is influenced by present and past social interactions"(p.9). Vygotsky's theory of the "Zone of Proximal Development" (ZPD) has become a

framework for dynamic assessment theory and practice. Vygotsky, (cited in Dixon-Krauss, 1996) described the ZPD "as the gap between the child's level of actual development determined by independent problem solving and his/her level of potential development determined problem solving supported by an adult or through collaboration with more capable peers"(p.9). This independent zone is uniquely set for each child; it is not stagnant but moves actively with the child's cognitive development. The examiner or mediator finds the ZPD for each child and intervenes at the proper distance within the zone in order to help a child achieve his/her potential. Lidz (1996) describes the ZPD: "The ZPD is the meeting place between the inner, mental world of the child and the external influences of the socio cultural environment as represented by the assessor" (p.282).

Feuerstein and his colleagues (1979) developed The Learning Potential Assessment Device (LPAD). Feuerstein (1979) based his LPAD on the theories of structural cognitive modifiability and mediated learning experience (MLE). Feuerstein stated that "structural cognitive modifiability (SCM) means that human beings have the ability to change or modify the structure of their cognitive functioning, as they respond to changes in life situations" (p.19). He defined change as affecting the whole organism and one that were self-perpetuating and generalized from the organism to other events (Feuerstein, 1979)

Feuerstein characterized a MLE as one in which a human being (mediator) changes the incoming stimuli by filtering, selecting, integrating and/or elaborating the information in order to have a change in the performance of the student or child (Feuerstein, Falik, Feuerstein, 1998). Feuerstein, et al (1979) stated that a "MLE creates

conditions of generalization and transfer of the acquired skill by building into the interaction the mediation of transcendence" (p.16). He further stated that, "All models of interaction may bear the quality of MLE, gestural, interaction, mimery, exposure to models of activities and of course verbal interactions, provided the three parameters of intentionality, reciprocity and transcendence of meaning are present" (p.16). An important aspect of MLE is that there is intention on the part of the mediator to change the stimuli, and there is reciprocity on part of the mediatee.

A metaphor to understand MLE experience is a camera. Light (stimulus) comes into the camera (mediator) to be imprinted on the film (mediatee) to develop a picture. If the light is too strong for the type of film (mediatee), the shutter (mediator) must contract its opening just enough in order to let the proper light in so the information can be processed by the mediatee (the film) and create a picture (response). If there is not enough light (stimulus), the shutter (mediator) opens up to let in as much light (stimulus) as possible to the film (mediatee) in order to have an appropriate response (a picture).

Feuersteins's LPAD proceeds according to a test-intervention-post-test procedure. Tasks can be numerical, verbal, spatial, figural, and pictorial oriented and require different operations such as serial, analogies, logical deduction or classifications (Feuerstein, et al. 1979). Feuerstein (1980) has developed a cognitive map, which is a model in terms of which a mental act can be analyzed according to seven parameters. These parameters are content, operations, modality, phase, level of complexity, level of abstraction and level of efficiency. He postulated one's cognitive deficiencies in terms of how an individual functions in three general areas: input, elaboration and output. Failures of performance are not attributed to lack of ability but are used to explain

inadequate development of operations, and peaks performances are indications of potential performance (Tzuriel & Haywood, 1992). Feuerstein believes in using curriculum-free tasks in assessment because the negative associations that learners have with curriculum based tasks. Laughton (1990) has criticized this feature of the LPAD's focus on these types of tasks because they are unrelated to classroom learning.

Piaget believed that children develop along a set course of development. For example according to Piaget, children ages 3-5 are in the 'pre-operational' and incapable of higher level thinking. There have been theorists that have recently challenged Piaget's theories based current research. For example, Gelman & Gallistel (cited in Flavell (1977) wrote: "Its easier to theorize about a development that progresses from a well defined set of early competencies to another more advanced set than about a development that progresses from the absence of any competencies to the presence of advance sets." (p. 48). Gelman (cited in Flavell) (1978) asked: "...are middle childhood minds and even adolescent and adult ones, as radically different from early childhood ones as Piaget believed?"(p.49)

In many cognitive areas there is evidence that young children do show aspects of higher cognitive operations and processes than Piaget originally believed. For example, Zaporosbets and Elkonin (cited in Lidz & Thomas) (1987) show that young children have a semblance of structure for abstract thinking. They wrote that "during the preschool age there is a shift from visual-motor thinking to visual figurative and there after to verbal thinking"(p.291). Gelman (cited in Flavell) (1977) showed that young children will lay down rudimentary schemas for relations, and that many children can begin to look at a problem from their internal reasoning (structure) not only from their direct visual

perception. Regarding spatial perception, while Piaget believed that children age 3-5 are in the pre-operational phase and were only capable of egocentric thinking. Mandler (cited in Flavell) (1977) showed that young children also looked at objects in relation to each other (allocentric) rather than looking at objects only to themselves (egocentric). Ratner and Myers (cited in Flavell) (1977) showed that even 2 years old have a schema for space and objects. Regarding classification of objects, Flavell (cited in Lidz & Thomas) (1987) believed that young children classify objects similarly to older children but differed regarding their knowledge of the items. Flavell (cited in Lidz and Thomas) (1987) wrote, "preschool children are also capable of abstraction and qualitative logic, but only in the form of identities and functions"(p.29). Numerically, Gelman 1980,1982; Siegler & Robinson, 1982 (cited in Flavell) (1977) showed that youngsters acquire numerical-reasoning principles as well as numerical abstractions during their early childhood years. Gelman postulates that numerical ability, similar to language development may build on cognitive sensitivities already present from infancy.

In the field of metacognition, Wellman (cited in Flavell) (1977) demonstrated that children as young as three will use mnemonic devices as aids in memory tasks. Cutie, Somerville and Wellman (cited in Flavell) (1977) showed support for this opinion when they preschoolers tests; the children gave evidence of some basic memory monitoring skills. DeLoache and Todd and Perlmutter (cited in Flavell) (1977) showed that young children will attempt to recall something if they are deliberately asked for it. Flavell summarized the research on metacognition in preschoolers as follows: "In other words, they will sometimes show what looks like deliberate memory strategies, something that the literature on strategy development would not lead us to expect to find in children so

young (p.236)." Many educators and researchers have concluded that preschool children do show independent use of cognitive structures that these structures can be analyzed. Siegler (cited in Lidz & Thomas) (1987) stated that, "early cognitive skills that are generally recognized to exist in the preschool child include: recognition, visual scanning categorical perception, and learning and intersensory integration"(p.291).

Dynamic Assessment Applied to Younger Children

Although Feuersteins's model of the LPAD has been primarily used with older children, there have been other dynamic assessments models that have been developed for pre-school children. For example, Tzuriel & Klein's (1987) study using their Children's Analogical Thinking Modifiability (CATM). The CATM is a dynamic assessment test that has 18 colored flat blocks and 3 sets of analogical thinking problems. It is presented in a game-like manner in order to maintain children's attention and stimulate the child to solve problems (Tzuriel & Klein 1987). Preschool children were divided into 4 groups: regular, special education, disadvantaged and mentally retarded (adolescents). There was an experimental and control group for each group. Results showed that the group that received mediation on the CATM produced higher scores on the Raven's matrices. The regular education and the disadvantaged groups showed the highest gains. Tzuriel and Klein wrote: "The results supported the hypothesis that young children as well as older mental retarded children can function on a higher level of thinking provided they were given adequate MLE" (p.283). Missiuna (cited in Lidz & Thomas, 1987) used the CATM with Canadian special needs preschoolers and provided scripted and non-scripted intervention adapted to a child's perceived responses and

difficulties. Children that who received mediational intervention outperformed both practice and instructional intervention groups during posttest performance.

Tzuriel & Klein (1988) also developed the Frame Test of Cognitive Modifiability (FTCM). This test taps problems with inductive reasoning, and the child needs to have previous knowledge of colors, numbers and location. Children, ages 4-5 was administered the FTCM and Raven matrices. Results showed that posttest-teaching scores of the FTCM were higher than pre-teaching scores. Location scores showed the largest change of all three dimensions (color, number, and location).

Tzuriel (1992) also developed the Children's Inferential Thinking Modifiability Test (CITM). Kindergarten and first grade children of low SES and middle SES backgrounds were asked to decide where a picture belonged in a visual scene, depending on previous visual information given to the child. Post-teaching scores was significantly higher than pre-teaching for all groups. The kindergarten group showed more improvement than the first grade group indicating that mediation could bring positive results with young children.

Burns (cited in Lidz) (1991) used a graduated prompt design for mediation, this format distances itself from 'true' dynamic assessment design by limiting the intervention of the examiner, but it does lend itself to easier psychometric analysis. The intervener could respond to each learner's strengths and weaknesses uniquely. Burns, (cited in Lidz) (1991) tested children with low McCarthy IQ scores (60-89) and compared graduated prompt and mediational intervention to each other and to a static test performance and then tested the children on their ability to transfer tasks. Specifically, children were first tested on the Animal House subtest of the Wechsler Preschool and

Primary Scale of Intelligence (WPPSI), tested on the static test SDT and then given intervention on the SDT according to their group assignment and retested on the SDT and on Animal House of the (WPPSI). In relation to their independent performance on the SDT the mediated group performed the highest, then followed by graduated prompt which was followed by static assessment. Regarding the ability to transfer tasks to the Animal House test of the WPPSI, Burns found that mediated learning and graduated prompt scored higher than static assessment but did not differ significantly from each other.

An experimental dynamic procedure study was conducted with the Leiter-Revised. Teachers were trained in Feuersteins's mediated learning approach in relation to the subtest of the Leiter-R. Two groups of children, one with cognitive delays, the second, typical school children, were first administered 3 Reasoning subtests and four Visualization subtests of the Leiter-R; then they received mediated intervention on the Leiter-R and retested. Significant increases were found on two subtests (not specified) for the cognitive delay group and three subtests they were significant changes (not specified) for the typical group (Roid & Miller, 1997).

Lidz and Thomas (1987) developed The Preschool Learning Assessment Device (PLAD). The PLAD used two standardized tests, the Kaufman Assessment Battery for Children (K-ABC), (subtest-Triangles) and Matrices. Lidz & Thomas then applied mediation to each test. Results showed that the mediated groups had achieved significantly higher scores than control groups on both Kaufman's ABC and Raven matrices. Additionally, a social competency rating scale was used to determine the concurrent validity of the PLAD. Results showed that the mediated groups achieved

significantly higher scores than the control groups on both Triangles and Matrices. Posttest difference scores between the mediated and control groups were significantly higher for the mediated group. Regarding concurrent validity there was a significant difference between the mediated group and control groups scores with Triangles and the social competency scale. Lidz & Thomas (1987) interpret this to illustrate that dynamic assessment is a significantly better predictor of adaptive behavior. While there have been attempts to develop an assessment scale for children that assess their cognitive skills they have been limited in their age range that they cover or bringing relevant clinical information to the clinicians.

The Application of Cognitive Functions Scale

Lidz and Jepson (1999) developed the Application of Cognitive Function Scale (ACFS) that focused on school readiness skills for preschool children. The ACFS assesses the child's responsiveness to instruction and mastery of cognitive processes and learning strategies that are directly related to early academic skills (Lidz & Jepsen, 1999). It follows a semi-scripted format for interventions. The ACFS yields three types of scores; one is the extent of the child's mastery of the task. The second is the responsiveness of the child to the interventions. Third, a behavior rating scale shows the quality of the child's response to the mediation given to the child for each task. To date there have been four studies involving the ACFS, those by Brookes (1997), Shurin (1999), Levy (1999), and Aranov (1999).

Shurin (1999) conducted a concurrent and construct validity study of the ACFS.

She tested 26 pre-school children using the ACFS. She found that there were significant gains between the pre and posttest scores on four of the six subtests. There also was a significant positive relationship between the ACFS Behavior Rating Scale and one post-test score. She also investigated the concurrent validity between the ACFS and the Differential Ability Scales (DAS) which yielded no significant results.

Levy (1999) conducted a discriminant validity study on the ACFS between special needs and typical pre-school children. Four out of the six posttest scores of the ACFS showed significant differences between the typical and special needs children. The behavior rating scale of the ACFS demonstrated that there were significant differences between the two groups on four out of the five categories rated.

Aranov (1999) studied the ACFS Behavior Observation Rating Scale (BORS) for reliability. Her results support inter-rater reliability between the experimenter ratings and teacher's rating of children being tested by the ACFS. Additionally, there was high reliability between experimenter and speech therapists and between teachers and speech therapist's ratings.

Brooks (1997) looked at practice effects concerning the ACFS. He tested 22 pre-school children with disabilities on the subtest classification of the ACFS. He split the children into two groups, one received mediation, the second received no mediation. All children were given the pre-test classification and post-test classification (ACFS). He found that two thirds of the children who received intervention moved from builder to grouper on the classification subtest, while none of the children in the control group that received no intervention was able to make the transition from builder to grouper.

PURPOSE OF THIS STUDY

There is general agreement that the earlier we can intervene in young children's delays and difficulties the more hope for success we can have. A dynamic assessment procedure for pre-school children could be a valuable tool in the treatment of cognitive and social delays of young children. It is necessary to investigate the psychometric properties of the ACFS as a procedure that shows promise in its relevance for ver young children. To date there have been studies which address concurrent, criterion, discriminant validity, inter-rated reliability and intra-test reliability. This study investigated the concurrent validity between the ACFS and The Leiter International Performance Test-R. It was hypothesized that similar subtests of the ACFS and the Leiter-R would show significant positive correlations, while non-similar subtests would not demonstrate significant positive correlations. For the purpose of this study the ACFS was not administered in its dynamic format; that is no intervention was offered. The purpose was only to investigate the concurrent validity of the subtests prior to intervention. The following subtests were hypothesized to show significant positive correlations:

ACFS SUBTEST	LEITER-R SUBTEST
1. Classification	Classification
	Matching

	Associated Pairs
2. Visual Memory	Forward Memory Repeated Patterns Immediate Recognition (age 4 and above.)
3. Pattern Completion	Repeated Patterns Sequential Order

The following are hypothesized not to show significant positive correlations:

1. Perspective Taking	Classification Associated Pairs
2. Auditory memory	All visual Leiter-R tests.
3. Verbal Planning	All Visual Leiter-R tests

METHOD

Participants:

The participants in this study were 15 children, between the ages of 3 to 5 years, who attend a therapeutic pre-school, Crossroads School for Child Development. The children all have delays in cognitive, emotional/social and speech and/or language domains. The gender of the children used for this study was 11 boys and two girls. Two children were eliminated from the study. One, was a 'typical' pre-schooler who attended Crossroads school part-time as a courtesy to her mother who was employed at the school. A second child was eliminated from the study due to his inability to be administered the ACFS and the majority of the Leiter-R subtests. The children came from mixed socioeconomic backgrounds ranging between low to lower-middle class. All parents were sent a consent form explaining the study and asking for their permission to include their child in the study. The examiner, the author of this study is a 3rd year graduate student in School Psychology program at Touro College.

Materials

Materials were the pretests of The Application of Cognitive Functions Scale (Lidz & Jepsen, 1995) and all subtests from the battery of 2-5 years of the Leiter-Revised International Performance Test-Revised (Roid & Miller). The ACFS analyzes cognitive processes of school readiness skills in six different areas:

1. **Classification**: The child is asked to sort blocks into groups. This task looks at ability to discriminate distinctive features and flexible thinking.

2. **Perspective Taking**: The child is asked to take the role of the teacher and teach the assessor how to draw a picture of a child provided.

3. **Short term Auditory Memory**: The child is asked to repeat a short story read by the examiner. This measures ability to recall details and sequential organization.

4. **Short term Visual Memory**: The child is asked to remember eight toys placed in front and then removed. This measures the awareness of the need to use a mnemonic strategy, as well as short-term memory.

5. **Verbal Planning**: The child is asked to tell the plan for making cookies. It measure child's awareness of multiple and sequential steps towards an identified goal.

6. **Sequential Pattern Completion**: The child is asked to complete a repetitive sequential pattern started by the assessor, using tangrams. The child is also asked to justify correct choices.

Scoring of the ACFS focuses on a child's responses with an emphasis on a child's metacognitive reasoning for their responses. Some of the tasks on the ACFS have a significant verbal loading that can present significant challenges for children who have delays in speech and language; however, well-developed language skills are not necessary (Lidz in press, 1999).

The Leiter-R (Roid & Miller, 1997) is a nonverbal standardized IQ test. The Leiter-R is normed for individuals between the ages of 2–20 years. There is a

Visualization and Reasoning battery and an Attention and Memory battery. The non verbal format and its focus on perceptual and visual skills gives an opportunity for children who have delays in speech and language and communication disorders to get a fair estimate of their cognitive ability (Roid & Miller, 1997). The following is a summary of the Leiter-R subtests:

Visual-Reasoning Battery

1. **Figure Ground**- The child must recognize an object in a field of increasingly distractible stimuli. The child needs good visual scanning skills and search strategy
2. **Form Completion**- The child is required to recognize and complete pictures from fragmented and broken items to a complete form or picture.
3. **Matching** The child is required to match visual stimuli to other visual stimuli. - No memory required. Visual perceptual skills.
4. **Sequential Order**- The child must understand the relationship between stimuli in order to find the missing elements at the end or in the middle of a series. Focuses on rules generation with sequential information.
5. **Repeated Patterns**- The child develops hypothesis from existing stimuli in the pattern. Deductive reasoning from a rule generated pattern in a symbol/form context.
6. **Picture Context**- The child is required to fill in the missing part, which must be determined from the context of the picture. Measures ecological value of certain stimuli.
7. **Classification**- Evaluates child's ability to sort items and develops into measuring a child's ability to see which items belong together.

Attention & Memory Battery

1. **Associated Pairs-** The child must make classic paired learning with brief distraction.
2. **Forward Memory-** The child must remember a sequential order of pictures pointed out to the child and repeat the order to the examiner.
3. **Immediate Recognition-** The child must remember a picture with a brief delay. (for ages 4 and above)

4. **Attention Sustained-** The child is shown an object that must be cancelled out in a picture with similar distractible stimuli. There is a time limit for each task.

Because of the seemingly similarity of some of the tasks demands and the appropriateness of the Leiter-R for young children, it appeared to be a good candidate for a concurrent validity study of the ACFS. Since the Leiter's revision in 1997 there have been various validity and reliability studies to support it use with the special needs population. For example, Leiter-R content validity study showed that the Leiter visualization battery correlated higher with the WISC performance battery than with the WISC complete battery (.65 median vs. .59 median) (Roid & Miller 1997). The Full Scale Leiter-R also correlated highly with the Woodcock-Johnson (.62 to .77 ages 6-20) (Roid & Miller 1997). Evidence of criterion validity was shown when the Leiter, using a cut-off point of IQ 70 achieved a 96% hit rate (correct identification of cognitive delay and correct non-identification of cognitive delay) classification of 80% of the cognitive delay sample (Roid & Miller 1997). A concurrent validity study between the Leiter-R and the WISC-III resulted in a correlation of .85 (Roid & Miller 1997). Correlation between the Leiter-R with the WIAT Reading was .69, and WIAT-Mathematics was .79

(Roid & Miller 1997).

Procedure

Participants were administered the Leiter-R first. Full Scale IQ (Visual battery 1st and Attention Memory battery 2nd) they were then administered the ACFS pretest. Testing of each child proceeded over 4–6 sessions, of approximately 45 minutes each.

The author of the ACFS, Carol Lidz PsyD. trained the examiner in the administration and scoring of the ACFS. The author of this study submitted to Dr. Lidz a synopsis of practice ACFS testing sessions. The examiner also submitted to Dr. Lidz two videotaped sessions of the administration of the Leiter–R. The examiner met with Dr. Lidz and critiqued the administration and scoring of the respective tests.

RESULTS

It should be noted that the initial sample size was reduced to 13 because one child was unable to complete the ACFS and a second child attended the pre-school part-time as a 'typical' child to a parent working in the school. The study investigated the relationships between the subtests of the ACFS pretests and the subtests of the Leiter-R. The first question addressed the extent of relationships between subtests purporting to measure similar variables. A Pearson Product Moment Correlation was conducted between all subtests of the ACFS with the Leiter-R. The following tables show the relationships of Classification, Visual Memory, and Pattern Completion (ACFS) with their related Leiter-R subtests.

Table 1

Pearson Product Moment Correlations between expected similar subtests of the ACFS and Leiter-R (N=13).

Leiter-R

Figure Ground			
Form Completion			
Matching	-.163		
Sequential Order			-.265
Repeated Patterns		.100	-.321
Picture Context	-.806**		
Classification	-.399		
Associated Pairs	-.240		
Forward Memory		.019	
Attention Sustained			
	Classification	Visual Memory	Pattern Completion

ACFS

**P. <. 001

Table 1shows the three subtests of the ACFS (Classification, Visual Memory, and Pattern Completion) with their anticipated Leiter-R subtest counterparts. The ACFS subtest Classification exhibited all negative correlations between the anticipated subtest pairs of the Leiter-R. Classification showed a significant negative correlation with Picture Context of -806**. The subtest Visual Memory showed a correlations of .019 with the Leiter-R subtest of Forward Memory of .019 and Repeated Patterns of .100 but not significant. Pattern Completion also showed a negative correlation with Repeated Patterns - .321 and Sequential Order -. 265 but were not significant.

There were some significant *positive* relationships that were demonstrated between the Leiter-R and the ACFS. Table 2 is a matrix of positive relationships **(Significant relationships in bold)** of unanticipated subtest pairs between both instruments. Related ACFS subtests are italicized.

Table 2

Pearson Product Correlation between ACFS subtest and Leiter-R having positive significant/ non-significant correlations. (Significant correlations in bold) (N=13)

Leiter-R

Figure Ground	.193	.338	.374	.179		.448
Form Completion.		.081	.	.400		
Matching.		.390	**.615***			.100
Sequential Order	.304	**.647***	.239	.186	.064	
Repeated Patterns	**.574***	.226	.421	.100		
Picture Context		.026	.041			.410
Classification		.307	.014	.349	.136	.331
Associated Pairs		**.590***	.073	.254	.254	.409
Forward Memory	.087	.292		.019	.019	.338
	Classification	Perspective Taking	Auditory Memory	Visual Memory	Verbal Planning	Pattern Completion

ACFS

***P< .05**

The classification subtest of the ACFS had a significant positive correlation with Repeated Patterns .574, P< .05. The ACFS Perspective Taking subtests had a significant positive correlation with Sequential Order .647, P< .05, and Associate Pairs .590 P<. 05. Auditory Memory of the ACFS did have a positive correlation with Matching of the Leiter-R, .615.

To control error and receive a more accurate level of significance due to the large amount of tests correlated, a Bonferroni level of significance was used. Using the Bonferroni's method yielded a P<.000925 level of significance. At this level of significance none of the correlations between subtests of the two instruments were

significant. This illustrated the weak relationship that exists between the two instruments.

Another question was did the Leiter-R total group composite scores for Visualization and Reasoning and Attention and Memory battery show a significant positive correlation with the group's overall ACFS score. A Pearson's product moment correlation was conducted for each battery with the ACFS. Table 3 and 4 shows the correlations.

Table 3
Pearson Product Correlation for total Leiter-R Attention and ACFS Composites.

		ACFS	L---Attention
ACFS	Pearson Correlation		.083
	Sig. (2-tailed)	.	.809
	N	13	11

P< .05

Table 4
Pearson Product Moment Correlation's between Leiter-R Visualization battery and ACFS total composite score.

		L-VISUALIZATION	ACFS
VISUALIZ-ATION	Pearson Correlation		-.051
	Sig. (2-tailed)	.	.870
	N	14	13

P< .05

Table 3 shows that the Leiter-R Attention battery had a .083 correlation with the total ACFS score. Table 4 shows that that the total Leiter-R Visualization composite Battery has a -. 051 correlation with the total ACFS score. Both of these correlations were not in the level of significance. Two separate calculations were used with the ACFS

because the Leiter-R does not have one overall composite score. Each battery has its own individual composite score.

It should be noted that children seemed to apply themselves better to the subtests of the Leiter-R. Many of the children have cognitive delays in the speech and language domains and their not having to express themselves to receive credit may have been to their advantage. Additionally, many of the children received no credit on the ACFS subtests, as the tasks without intervention were overwhelming to them.

DISCUSSION

This study investigated the concurrent validity of the ACFS in relation to the Leiter-R as a criterion measure. None of the predicted relationships between subtests was significant. There were, however, some unanticipated significant positive relationships, specifically between Classification and Repeated Patterns, Perspective Taking and Sequential Order Perspective Taking and Associated Pairs and Auditory Memory and Matching.

One factor to take into account in interpreting the results is that the presentation and administration of the two tests were not counterbalanced in order of presentation. This was an oversight of the examiner, and must be factored into looking at the effects of the results. These results are similar to Shurin's (1999) study of concurrent validity between the ACFS and the DAS, which did not find a significant relationship between the ACFS and the criterion measure. There are a number of issues that may relate to the results. For example, the Leiter's-R test format consists of one to two teaching trials before the actual scoring trials, this gives the student a chance to learn strategy, objective, goals and receive praise for the specific trials of each subtest. The first few trials are similar in nature to the teaching trials, giving the student an opportunity build up their scores.

Another reason that similar tests did not show a significant positive correlation may be due to the psychometric properties of both tests. The Leiter-R score were standardized scores, while the ACFS scores were raw data scores not standardized to a representative sample. Another important reason for the disparity of scores between the

two tests is the small sample size of the study (14 participants).

The students seemed unfamiliar with 'taking the lead' during the task presented to them. For example, in the subtest, Perspective Taking or Verbal Planning. Furthermore, in the subtest Perspective Taking, the students seemed unfamiliar with being able to understand the goal of helping the examiner draw the picture presented. It is possible that students have already been trained to expect the teacher to come to help them with a task. Many of the children were embarrassed about their proficiency in drawing and seemed uncomfortable with becoming the teacher. In the subtest Verbal Planning the students also seemed uncomfortable with communicating to the examiner about how to prepare a meal. As the ACFS is a dynamic assessment procedure, these responses are not indications of failures or incompetence but material to have the mediator work with the child. The ACFS pretests are purposely challenging for the children, who are then provided with intervention to facilitate their competence. In this study, the intervention was not provided.

Three subtests of the ACFS were hypothesized to show a positive correlation with the Leiter-R based on the presumption that similar processes were being measured. However, these subtests might be measuring related but not actually the same processes. For the classification subtest of the ACFS a child's success depends on grouping and building of blocks; on the classification subtest of the Leiter-R the child's firsts sorts on a simple level and then advances up to more difficult grouping of items (i.e. dog to a bone item #7). Later items on Classification on the Leiter-R are aligned with matching (Roid & Miller, 1997). Additionally, the Leiter has been normed on an age population of 2years to 20 years and will accordingly have more variable tasks. The ACFS is focused on tasks

related only to pre-school children's skills.

Another example of a different process being measured is Visual Memory (ACFS) and Forward Memory (Leiter-R). Visual Memory tested a child's ability to remember toy animals and objects in a short-term. Forward Memory of the Leiter-R tested short-term memory but within a sequential format. This is higher order ability than the ACFS tests. Further, the teaching trials were on a simple sequence (one or two pictures). The first tasks of the Leiter-R were almost identical and if a child received credit for the first items when the score was normed they received an average score. Pattern Completion of the ACFS and Repeated Patterns of the Leiter-R were in fact very similar in administration, yet, there was a negative correlation of -. 321. The teaching trials that preceded the subtests of the Leiter-R may account for some of this negative relationship.

Another factor of testing format to take into consideration is the effect of non-verbal administration of the Leiter-R and its effect on the relationship between the two instruments. Many of the children were weak in the verbal domain and may have performed stronger on the Leiter-R due to the non-verbal administration. Scoring of some of the ACFS subtests places an emphasis on the child's verbal response. For example, on Pattern Completion the child can receive extra points for stating their reason of choice. The focus of the ACFS is on the child's metacognitive skills is beyond the scope of the Leiter's purpose and is generally where static assessment leaves off and dynamic assessment continues on.

As with any concurrent validity study, there are issues regarding the adequacy of the criterion measure and the implication of nonsignificant results. Nevertheless, it is

clear from this study that the ACFS pretests and the Leiter-R subtests are tapping generally unrelated variables.

CONCLUSION

This study only partially documented support for concurrent validity between the Leiter-R and the ACFS. All subtests assumed to be similar between the two instruments did not have a significant positive relationship. Although, that were significant positive relationships that were unanticipated was found between the two instruments. One was in a subtest classification that was assumed to be related to the Leiter-R subtests, although it was with a subtest that was not originally predicted to correlate with (Repeated Patterns). There were three other significant correlations that were originally assumed to not correlate with the Leiter-R subtests. This may illustrate that although subtests, in some cases, may appear different there are overlap of processes not previously assumed to be. Various factors of a small sample size, different testing formats and the ACFS not being standardized may have contributed to these results. Future studies should try to take these matters into considerations in order to provide a more accurate measurement of concurrent validity. One suggestion is to measure post test scores of the ACFS with the Leiter-R in order to balance the teaching trials of the Leiter-R. Another suggestion is to use a larger sample size in comparisons and different sample groups for further comparisons as Shurin (1999) and Levy (1999) used in their studies.

REFERENCES

Anastasi, A. (Ed.). (1998). Psychological Testing (Sixth edition, p.504). New York: Macmillan Publishing Company.

Arthur, G. (1947). A point scale of performance tests. New York: Psychological Corporation.

Babad, E. & Bashi, J. (1975). Final report: An educational test of the validity of learning potential measurement. Cambridge, MA: Research Institute for Educational Problems, Inc.

Bodrova, E. & Leong, D. (1996) Tools of the mind. The Vygotskian approach to early childhood education. Englewood Cliffs, NJ: Prentice Hall/Merrill.

Brooks, N.D. (1997)... Unpublished masters thesis; University of Newcastle Upon Tyne; Newcastle, United kingdom

Brown, A.L. & Campione, J. (1990) Communities of learning and thinking, or a context by any other name. Contributions to Human Development, 21, 108-126.

Brooks, N.D. (1997). Unpublished master's thesis; University Upon Tyne; Newcastle, United Kingdom.

Burns, M.S. (1980). Preschool children's approach and performance on cognitive tasks. Unpublished masters thesis; George Peabody College for Teachers at Vanderbilt University.

Burns, M.S. (1983). Comparison of "graduated Prompt" and "mediational" dynamic assessment and static assessment with young children. Unpublished doctoral dissertation, Vanderbilt University, Nashville, Tennessee.

Campione, J.C. & Brown, A.L. (1987) Linking dynamic assessment with school

achievement. In C.S. Lidz (ed.), Dynamic assessment: An interactional approach to evaluating learning potential (pp. 85-115). New York: Guilford

Carlson, J.S., & Wiedl, K.H. (1980). Applications of a dynamic testing approach in intelligence assessment: Empirical results and theoretical formulations. Zeitschrift for Differentiele und diagnostische psychologie, 1,303-318.

Clements, D. & Natasi, B. (1990) Dynamic approach to Measurement of Children's Metacomponential functioning. Intelligence, 14, 109-125.

Dixon-Krauss, L.D. (1996). Vygotsky in the classroom. New York: Longman

Feuerstein, R., Rand Y., Hoffman M.B. & Miller R. (1980). Instructional Enrichment. Baltimore: University Park Press.

Feuerstein, R., Falik, L & Feuerstein, R. (1998). The Learning Potential Assessment Device in Feuerstein, Kaufman, Lewis, Kaufman, Samuda, & Sternberg R. Eds. Advances in cross-cultural assessment (pp. 100-161). Thousand Oaks, Ca: Sage Publications.

Feuerstein, R., S. Feuerstein (1991) Mediated learning experience: A Theoretical Review in Feuerstein, R., Klein, P. & Tannenbaum A. (Eds.) Mediated Learning Experience (MLE): Theoretical, Psychosocial and Learning Implications (pp. 3-40) Freund Publishing House Ltd.: London, England

Feuerstein, R., Feuerstein R. & Gross, S. (1996). The Learning Potential Assessment Device in Flanagan, D. Genshaft, J. & Harrison, P. (Eds.) Contemporary Intellectual Assessment (pp 297-310) New York: The Guilford Press

Feuerstein, R., Rand Y., Hoffman, M. & Miller, R. (1979). Dynamic Assessment of retarded performers. Baltimore: University Park Press.

Flavell, J.H. (1977). Cognitive development, second edition. Englewood Cliffs, NJ: Prentice-Hall.

Frisby, C. & Braden, (1992?). Dynamic Assessment approach: A semantic, logical and empirical critique. The Journal of Special Education, 26, 281- 299.

Haywood, C.H. (1993). A mediational teaching style. International Journal of Cognitive Education & Mediational Learning, 3, 27–38.

Haywood, C. H., Brown, A.L. & Wingenfeld, S. (1990). Dynamic approaches to psychoeducational assessment. School Psychology Review, 19, 411–422.

Klein, P. (1992). Assessing cognitive modifiability of infants and toddlers: Observations based on mediated learning experience. In H. C. Haywood, & D. Tzuriel (Eds.), Interactive assessment (pp. 233 – 250). New York: Springer - Verlag.

Levy, C. (1999). The discriminant validity of the Application of Cognitive Functions Scale (ACFS): A performance comparison between typically developing and special needs preschool children. Unpublished Master's Thesis Touro College. New York: New York.

Lidz, C., (1983). Dynamic Assessment and the Preschool Child. Journal of Psychoeducational Assessment, 1, 59 – 72.

Lidz, C., (1986). Assessment of exceptional children. Emerging Perspectives on Assessment of Exceptional Children 2, 142 – 159.

Lidz, C., (1990). Issues in the assessment of preschool children. In B. Bracken (Ed.), Psychoeducational Assessment of Preschool Children (pp. 18–31). Boston: Allyn & Bacon

Lidz, C., (1991). Practitioner's guide to dynamic assessment (Chapter 1 & 4).

New York: Guilford Press.

Lidz, C., (1996). Dynamic assessment approaches. In Flanagan, D.P., Genshaft, J.L. & Harrison, P.L. (Eds.). Contemporary intellectual assessment, theories, test and issues (pp. 281- 296). New York: Guilford Press.

Lidz, C.S. (in press). The Application of Cognitive Functions Scale (ACFS): An example of curriculum-based dynamic assessment In C.S. Lidz & J. Elliott (Eds.) Dynamic assessment: Prevailing models and applications. Oxford (UK): Elsevier

Lidz C. & Thomas C. (1987). The Preschool Learning Assessment Device: Extension of a static approach. In C. Lidz (Ed.), Dynamic Assessment. An interactional approach to evaluating learning potential (pp. 289–307). New York: Guilford Press.

Lidz, C.S. & Jepsen, R.H. Applications of Cognitive Functions Scale (ACFS) (1999), Research Edition, Revision

Roid, G.H. & Miller, L.J. (1997). Leiter-Revised International Performance Scale- Revised: Examiner's manual. Wood Dale, IL: Stoelting Co.

Shurin, R. (1999). Concurrent and discriminant validity of a dynamic assessment procedure with special needs and typical preschool children. Unpublished Master's thesis, Touro College, New York City, New York.

Tzuriel, D. & Klein P.S. (1987). Assessing the young child: Children's analogical thinking modifiability. In C.S. Lidz (Ed.), Dynamic Assessment (pp. 268-282). New York: Guilford.

Tzuriel D. & Klein, P.S. (1988). The Frame Test of Cognitive Modifiability: Manuel. Ramat Gan, Israel: Bar Ilan University.

Tzuriel, D., (1992). The dynamic assessment approach: A reply to Frisby and

Braden. The Journal of Special Education, 26, 302-321.

Tzuriel D. & Haywood C. H. (1992). The Development of interactive-dynamic approaches to assessment of learning potential.....

Tzuriel D. & Klein P. (1987). Assessing the young child: Children's Analogical Thinking Modifiability. In C.S. Lidz (Ed.), (1987). Dynamic assessment: An interactional approach to evaluating learning potential (pp.268-287). New York: The Guilford Press.

APPENDIX A

CROSSROADS SCHOOL FOR CHILD DEVELOPMENT

LAWRENCE, N.Y.

Dear Parent/Guardian:

I am a Psychology intern previously under the supervision of Dr. Jay Silverstein and a graduate student at Touro College, Graduate School of Education & Psychology. I am doing a project of how students respond to different methods of intervention during assessment; it is named "dynamic assessment". My study is to verify a preschool measure as accurate: this means that the test is measuring the processes it says it is measuring. The age range of the children I am using is from approximately 3 – 5 years old, the pre-school range. This is an age when students' are developing their educational skills. Studies show that we are most successful in assisting students when we work with them at the earliest age possible.

Testing would be conducted in two parts. One session will be a standard non-verbal assessment test, one which children find the exercises fun. The other part will be the first part of the dynamic assessment. Each session will take between ½ hour to 1 hour. All information will be confidential.

A summary of results will be forwarded to Dr. Silverstein. Any parent can speak with Dr. Silverstein regarding the results of their child. I give permission for my son/daughter to be used in the project.

Signature _____

Date _____